<u>What is claimed is</u>

1.   An apparatus for coding an image signal comprising:

a wavelet transform unit for wavelet transforming an input image signal;

a vector construct unit for constructing vectors using the wavelet transformed result, each vector having a tree structure in a different direction;

an error vector generation unit for generating a plurality of error vectors by setting one of the vectors as a basic vector and performing a calculation on each of vectors remaining with respect to the basic vector;

a scan unit for scanning the coefficients of each of the basic vector and error vectors in a different direction;

a first vector quantization unit for generating a first codebook for the basic vector scanned in the scan unit, quantizing the scanned basic vector using the first codebook, and outputting the quantization result as the index of the first codebook; and

a second vector quantization unit for generating a second codebook for the error vectors scanned in the scan unit, quantizing the scanned error vectors using the second codebook, and outputting the quantization results as the indices of the second codebook.

2.   The apparatus of claim 1, wherein the wavelet transform unit wavelet transforms the input image signal so that the low frequency sub-band of the image signal is decomposed in a 2-dimensional (2D) region.

3.   The apparatus of claim 2, wherein in the vector construct unit the coefficients of vectors having parent-children relations between sub-bands form a tree structure and the tree structure is formed in the horizontal direction, in the vertical direction, and in the diagonal direction.

4.   The apparatus of claim 3, wherein the error vector generation unit sets the diagonal direction vector as the basic vector and subtracts each of the horizontal direction vector and vertical direction vector from the basic vector to generate the error vectors.

5.   The apparatus of claim 3, wherein the error vector generation unit sets the diagonal direction vector as a basic vector and adds each of the horizontal direction vector and vertical direction vector to the basic vector to generate the error vectors.

6.   The apparatus of claim 3, wherein the scan unit zigzag scans the coefficients of the basic vector and scans the coefficients of the error vectors in the horizontal direction and in the vertical direction.

7.   The apparatus of claim 1, wherein the wavelet transform unit performs a 2-dimensional packet decomposition with respect to the input image signal.

8.   The apparatus of claim 1, wherein if the image signal is moving pictures, the wavelet transform unit wavelet transforms the image signal in a time region and then wavelet transforms in a spatial region the signal which is wavelet transformed in the time region.

9.   A method for coding an image signal comprising:

        (a) wavelet transforming an input image signal;

        (b) constructing a vector having a tree structure in the horizontal direction, in the vertical direction, and in the diagonal direction, using the wavelet transformed result;

(c) setting the diagonal direction vector as a basic vector and generating a plurality of error vectors by performing a calculation on each of the horizontal direction vector and vertical direction vector with respect to the basic vector;

(d) scanning the basic vector and error vectors according to different methods;

(e) generating a first codebook for the scanned basic vector, quantizing the scanned data using the first codebook, and outputting the quantization result as the index of the first codebook; and

(f) generating a second codebook for the scanned error vectors, quantizing the scanned data using the second codebook, and outputting the quantization results as the second and third indices of the second codebook.

10. The method of claim 9, wherein in step (a) a wavelet transform is performed so that the low frequency sub-band of the image signal is decomposed in a 2D region.

11. The method of claim 10, wherein in step (c) the error vectors are generated by subtracting the horizontal direction vector and the vertical direction vector from the basic vector.

12. The method of claim 10, wherein in step (c) the error vectors are generated by adding the horizontal direction vector and the vertical direction vector to the basic vector.

13. The method of claim 9, wherein in step (c) the image signal is decomposed by a 2D packet decomposition.

14. The method of claim 13, wherein a vector having an adaptive tree structure is constructed according to the result of the wavelet packet transform.

15.   A method for coding an image signal comprising:

(a) wavelet transforming an input 3-dimensional (3D) moving picture signal in a time region;

(b) wavelet transforming in a spatial region the result of the wavelet transform in step (a);

(c) constructing vectors, each having a 3D tree structure, using the result wavelet transformed in steps (a) and (b);

(d) setting one among the vectors, each having a tree structure, as a basic vector, and generating a plurality of error vectors from the remaining vectors using the basic vector;

(e) scanning the basic vector and error vectors according to different methods; and

(f) quantizing the scanned basic vector and error vectors.